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NITROCELLULOSE EXPLOSIVE AND PROCESS OF MAKING THE SAME

No Drawing. Original application filed March 12, 1925, Serial No. 15,120. Divided and this application filed October 28, 1926. Serial No. 144,915.

This invention relates to explosives and more particularly to explosives employing a tetra-nitro-anilin. This application is a division of application Serial Number 15,120, filed March 12, 1925.

After the conclusion of the World War there was and is now on hand large quantities of smokeless powder; this powder in its available form has practically no peace time utility and has, therefore, a low commercial value. It is in the form of a dense colloided nitro-cellulose and usually is coated or impregnated with a deterrent to render it progressive burning.

One of the objects of this invention, therefore, is to sensitize such a nitro-cellulose powder.

Another object is to provide an explosive grain, and more particularly one of nitro-cellulose, which is coated or impregnated with tetra-nitro-anilin.

Further objects will appear from the detail description in which an illustrative embodiment will be described; it is, however, to be understood that the invention is susceptible of various other embodiments.

In accordance with this invention a small percentage of a tetra-nitro-anilin is intimately mixed with a larger percentage of a less sensitive or cheaper nitro-hydrocarbon, and this is preferably accomplished by dissolving the brisant tetra-nitro-anilin in the less sensitive component. Suitable solvents of tetra-nitro-anilin adapted for this purpose are aromatic nitro-compounds, of which tri-nitro-toluene, di-nitro-toluene, tri-nitro-benzene, di-nitro-benzene, etc., as well as picric acid are examples. Furthermore mixtures of nitro-hydrocarbons may be used; these mixtures are of special advantage when the nitro-hydrocarbons have high melting points, for by using mixtures of such compounds in molecular proportions the melting points are depressed. Suitable mixtures, in molecular proportions, are: tri-nitro-toluene and tri-nitro-benzene, tri-nitro-toluene and di-nitro-benzene, tri-nitro-toluene and picric acid, etc. Whether a single nitro-hydrocarbon or mixtures of nitro-hydrocarbons are used, the tetra-nitro-anilin is dissolved in the molten solvent. This can be accomplished by heating the tetra-nitro-anilin and the less sensitive nitro-hydrocarbon, in the desired proportions, in a suitable container until the solution of the tetra-nitro-anilin in the nitro-hydrocarbon is complete; solution takes place at a temperature from 85° C.–86° C.

In accordance with this invention, such a solution is employed for surface treating, i. e., coating or impregnating smokeless powder, such as dense colloided nitro-cellulose, either coated or uncoated. Thus a solution of 2%–15% of tetra-nitro-anilin in tri-nitro-toluene, di-nitro-toluene, tri-nitro-benzene or di-nitro-benzene may be employed and applied in the ordinary manner, namely by rumbling the solution with the powder in the presence of heat, at a sufficient temperature and for a sufficient period, to cause such coating or impregnation; thus heating at the melting point of the solution for about one hour will generally be found proper. In such a process the insensitive nitro-hydrocarbon, such as tri-nitro-toluene, di-nitro-toluene, etc., acts as a colloiding agent to fix the tetra-nitro-anilin on the surface of the nitro-cellulose powder. The result is that the properties of the nitro-cellulose powder are improved on account of an increase in ballistic value due to the fact that the coating is more sensitive to ignition than when a single and rather insensitive nitro-hydrocarbon is used.

There is thus produced an explosive grain which is coated or impregnated with tetra-nitro-anilin, and more particularly a nitro-cellulose grain coated or impregneated with a tetra-nitro-anilin dissolved in a less sensitive nitro-hydrocarbon vehicle. The powder grain so produced are more sensitive to ignition so as to enable them to be practically employed as the propellent charges of shot shells, although they are susceptible of general use as a propellent or an explosive.

It is obvious that various changes may be made in details without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the details described.

Having thus described the invention what is claimed is:

1. An explosive nitro-cellulose grain surface-coated with a tetra-nitro-anilin.

2. An explosive nitro-cellulose grain surface-treated with a tetra-nitro-anilin and a less sensitive aromatic nitro-compound.

3. The process of sensitizing nitro-cellulose grains comprising, treating the grains with a tetra-nirto-anilin dissolved in an aromatic nitro-compound at the melting point of the solution.

In testimony whereof we have this 13th day of October, 1926 affixed our signatures.

ARTHUR S. O'NEIL.
ALFONS G. SCHURICHT.

CERTIFICATE OF CORRECTION.

Patent No. 1,849,356. Granted March 15, 1932, to

ARTHUR S. O'NEIL ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 1 and 2, claim 1, for the compound word "surface-coated" read surface-treated; same page, after line 2, insert the following as claims 2, 3, 4, 5, 6, 7, and 8, respectively-

2. An explosive nitro-cellulose grain surface-treated with a tetra-nitro-anilin desolved in a vehicle.

3. An explosive nitro-cellulose grain surface-treated with a tetra-nitro-anilin desolved in a nitro-toluene.

4. An explosive nitro-cellulose grain surface-treated with a small percentage of a tetra-nitro-anilin dissolved in a large percentage of an aromatic nitro-compound.

5. The process of sensitizing nitro-cellulose grains comprising, heating the grains in the presence of a tetra-nitro-anilin at the melting point thereof.

6. The process of sensitizing nitro-cellulose grains comprising, heating the grains in the presence of a tetra-nitro-anilin and a less sensitive vehicle at the melting point thereof.

7. The process of sensitizing nitro-cellulose grains comprising, treating the grains with a tetra-nitro-anilin at a temperature and for a period sufficient to surface-treat the grains.

8. The process of sensitizing nitro-cellulose grains, comprising, treating the grains with a tetra-nitro-anilin and a less sensitive vehicle at a temperature and for a period sufficient to surface-treat the grains.

Lines 3 and 6, for the claim numerals 2 and 3, read 9 and 10 respectively; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of June, A. D. 1932.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)